

Figure 1A**Nucleotide sequence of inserted environmental DNA in clone ELIP
(SEQ ID NO:1)**

TCTATGAGCA	ACAAGGCGGT	TTTAGCGAAG	CGCAGGCCGA	TGAGTTTGTG	50
GCCGAGGCGC	TGGAAACATT	CCGCTGGCAC	CAGCACGCAA	CGGTTGACGC	100
CGAAACCTAC	CGCGCGTTGC	ATGATGAGCA	CCGGCTGATC	GCCGATGTAG	150
TCTGCTTCCG	TGGCTGCCAC	ATTAACCACC	TGACCCCGCG	CACGCTCGAT	200
ATCGACCGCG	TGCAGTCGCT	GATGCCGGAA	CGCGGAATTA	CCCCAAAAGC	250
CATTATCGAA	GGGCCGCCGC	GCCGCGAGCG	CCCGATTTTA	CTGCGCCAGA	300
CCAGCTTTAA	AGCGCTGGAA	GAGCCTATTT	TGTTTCGCCG	TGAGCATCAC	350
GGAACGCATA	CCGCCCGTTT	CGGCGAAATA	GAACAGCGCG	GCGTAGCGCT	400
GACGCCGAAA	GGCCGGGCGC	TGTACGACGA	ACTGCTGCTG	GCGGCGGGCA	450
ACGGCACGGA	TAATCTCAGC	CACCAGCAGC	ATTTACACGA	AGTGTTTACC	500
GTTTCCCCTG	CAGCGACGCG	CTGCTGCGCC	GCCAGGGGCT	GGCCTATTTT	550
CGCTATCGTT	TGACGCCCGT	TGGCGAAATG	CACCGCCACT	CAATCAAGCC	600
AGGCGACGAC	CCGCGAGTGC	TTATAGAACG	CGGCTGGCTG	GTGGCGCAGC	650
CGGTTATTTA	TGAAGATTTT	CTCCCGGTCA	GCGCGGCGGG	TATTTTCCAG	700
TCAAACCTTG	GCAGCGACGG	CGGGCAACGG	CAGCACGGCC	ATTCCAGCCG	750
CAGCGAGTTT	GAACAGGCCC	TTGGCGCAGA	GGTTGCAGAC	GAGTTCGCC	800
TCTATCAGCA	GGCCGAGGAT	CGCAGTAAAC	GCCGTTGCGG	TTTGCTGTAA	850
ACGCGCTACC	CTGCTGGAGT	GTCAGTAAAC	AGGAACAGCA	GATGGAACAA	900
GTTGTTAGCC	GTTGCTCAGG	GGAGACTGAG	CGGCGTTCTT	CAGGGGAAAG	950
TTGCGGTCTA	TCGCGGCATC	CCCTTTGCCG	CTCCGCCGGT	GGGTGAACTG	1000
CGCTGGCGGG	CACCTCGTCC	CCCGGCGCAC	TGGCAGGGTA	TCCGCCAGGC	1050
GGATACATTT	GCGCCTGCAT	GCTGGCAAAG	CCTCGAATAC	TGCAAAGCGG	1100
TTGGCGGCGG	CGATCCCGGC	CAGTTTTCTG	AAGATTGCCT	GTATCTCAAT	1150
ATCTGGACCC	CGGCCCGGCG	GGATGCGGAG	CCGCTGCCCG	<u>TTATGGTCTG</u>	1200
<u>CTGTCACGGT</u>	<u>GGGGGCTACA</u>	<u>CTATCGGCGC</u>	<u>AGGCTCGCTG</u>	<u>CCGCCCTACG</u>	1250
<u>ATGGAGCAGC</u>	<u>CTTCGCCTCG</u>	<u>CGGGATGTAG</u>	<u>TCCTGGTGAC</u>	<u>GGTGAATTAC</u>	1300
<u>CGTCTTGGCC</u>	<u>ATCTCGGCTT</u>	<u>TTTCGCCCAT</u>	<u>CCGGCGCTGG</u>	<u>ATGAAGAAAA</u>	1350
<u>TCCAGACGGC</u>	<u>CCGGTTTATA</u>	<u>ATTTTCGCGT</u>	<u>TTTAGACCAA</u>	<u>ATTGCTGCCC</u>	1400
<u>TGAAATGGGT</u>	<u>GCAGGAAAT</u>	<u>ATCGCTGCTT</u>	<u>TCGGCGGCGA</u>	<u>CGCGGGGAAT</u>	1450
<u>GTCACGCTGT</u>	<u>TTGGCGAGTC</u>	<u>TGCCGGGGCG</u>	<u>CGTAGCGTGC</u>	<u>TTTCGCTGCT</u>	1500
<u>GGCGTCGCCG</u>	<u>CTGGCGAAAA</u>	<u>ACCTTTTCCA</u>	<u>CAAAGGTATT</u>	<u>ATACAAAGCG</u>	1550
<u>CCTACACGTT</u>	<u>CCGGATGTC</u>	<u>GACAGGAAGA</u>	<u>AAGCCCTGAA</u>	<u>ACGTGGCGTA</u>	1600
<u>GCGCTGGCCG</u>	<u>GTCATTACGG</u>	<u>GCTGCAAAAT</u>	<u>GCCACAGCGG</u>	<u>ATGAACTCCG</u>	1650
<u>CGCTCTGCCT</u>	<u>GCGGATGGGC</u>	<u>TGTGGGCGCT</u>	<u>TGAAGGGCCG</u>	<u>CTTAACATTG</u>	1700
<u>GTCCAACGCC</u>	<u>AATCTCCGGC</u>	<u>GACGTCGTGC</u>	<u>TGCCTGAGCC</u>	<u>GATGCTGGAT</u>	1750
<u>ATATTCTTCG</u>	<u>CCGGGCGTCA</u>	<u>GCACCGCATG</u>	<u>CCCTTGATGG</u>	<u>TCGGGAGCAA</u>	1800
<u>CAGCGACGAG</u>	<u>GCAAGCGTGC</u>	<u>TGAGCTACTT</u>	<u>CGGCATCGAT</u>	<u>CCTGCCGGGC</u>	1850
<u>AGGTGGAAT</u>	<u>GCTGCGCCGG</u>	<u>GGAGCGGCGT</u>	<u>TTCCGGACTG</u>	<u>GGGGCTTATC</u>	1900
<u>AAACTGCTGT</u>	<u>ATTCCCGGAG</u>	<u>TGAAANGGGG</u>	<u>ATGCCCGAAC</u>	<u>TCGGGCGACA</u>	1950
<u>GGTGTGCCGC</u>	<u>GATATGGCTT</u>	<u>TTNCCNCGCT</u>	<u>GGGTTTTGTT</u>	<u>GTGATGCAGG</u>	2000
<u>CCCAGCAGCG</u>	<u>GGTCAATCAG</u>	<u>CCCTGCTGGC</u>	<u>GCTACTATTT</u>	<u>TGATTATGTG</u>	2050
<u>GGGGAGGCGG</u>	<u>AACGTAAAT</u>	<u>CTATGCCAAC</u>	<u>GGCACCTGGC</u>	<u>ACGGCAACGA</u>	2100
<u>AGTGCCGTAT</u>	<u>GTTTTTGACA</u>	<u>CGTTAAGTCT</u>	<u>GACGCCACCC</u>	<u>GCAAGTGAAT</u>	2150
<u>ACGTCAACCA</u>	<u>AAACGATCTC</u>	<u>ACGTTTGCCG</u>	<u>GGCAAATTTG</u>	<u>TGACTACTGG</u>	2200
<u>ACCCGTTTTG</u>	<u>CCCGCAGCGC</u>	<u>CGGTCCCCAC</u>	<u>AGTAAAGCGA</u>	<u>TACCGGGCCC</u>	2250
<u>GCTAAGCTGG</u>	<u>CCTGCCTGCG</u>	<u>TTCGCGGCAA</u>	<u>GGACCGAACG</u>	<u>ATGCGGTTAG</u>	2300
<u>GCGTTCACTC</u>	<u>GCGGGCGCGG</u>	<u>TTCAAAGTGG</u>	<u>AAAACCGCTT</u>	<u>TATGCGCATG</u>	2350
<u>AGAATGCAGC</u>	<u>TGTTTAAGCG</u>	<u>GGTCATGAAG</u>	<u>CATCACGTCA</u>	<u>GCCTTGACTG</u>	2400

Figure 1B**Nucleotide sequence of inserted environmental DNA in clone ELIP
(SEQ ID NO:1)**

AGCAACTCAT	GGCAAAATGC	TTCAAGCCCG	GCGGCGTGCT	CGCTGCCGGG	2450
TTTAACCGCC	AGACGGTAGC	CCGCACCGGT	TTTTTACACTG	CGATCAAACG	2500
GCCTGACCAG	CCGCCCCGTA	CGAATATCTT	CTGCCACCAG	CGTTTTCATCG	2550
GCGATGGCGA	TCCCAAACCC	CTGAATAGCG	GCGCTGATGG	CGAGATCCAT	2600
AGTGTCAAAA	TGCTGATTTT	TACTCATTGC	CTGCCAGGGC	GCAAGAAAAC	2650
CCGGTTCTGC	CAGAAGTGAC	CAGTCGGTGC	GGTCCCGCGT	TGGGTGCAAA	2700
AATGTCAGTC	TTTCCCAGCC	GCTATCTTCT	TTTGGCAGCA	GGCTCTGGCT	2750
TACAACCGGC	GTCAGCGCCT	CCTCGAACAA	CAGCGTGCCG	GTTTTTCGCCG	2800
ACTGCCCAAA	AACAATTGCC	GCGTCAAACG	GCTCATTTTTT	GAAGTTCACG	2850
CCGTGCTCAA	CGGTCTGTTG	CAGCGCAACC	TGTAGCTCCG	GCATGCGTTG	2900
TTCAAGCTGA	ATCAGCTTTG	GCACCAGCCA	GCGCATCGCG	CAGGTTGGCG	2950
CTTTAAGACG	AATAATTTCT	GGCTTGTGGC	AGGCGCGGTC	GGCTACGTCC	3000
AGCAGATTAT	TGAACGCGCT	TTGTAATTCC	GGGAGCAGGG	CGCTGCCCTG	3050
TGGCGTAAGG	CGCAGCCCGC	GCGCGTGCGC	TTCAAAAAGC	GCAAAGCCAA	3100
GCCACTGTTT	GAGGGCGGCA	ATTTTTCGCGC	TGACGGCGCC	CTGGGTGAGG	3150
CAAAGTTCCT	TCGCGGCCCT	GGTCAGGTTT	AGGTGCCTGG	CGGGTGACGA	3200
GAAAAGCGTC	CAGAGTATTC	AGGGGAAAAT	TGCGCCGCGT	CATGATGCTC	3250
TCCGTTGAGC	TATGCATTTT	TTGCATGGCT	ATTATGACAA	CAATTCGATT	3300
GTCGTGGCAA	TCGCATCCGG	ATTGAATAGT	TATGCAAATC	GCATATTGTT	3350
CAGGAGCGGC	TATGGCCATG	CAAACCCCGG	TGCAACATCG	TTCAAAACTG	3400
CCGGATGTAG	GAACCACCAT	ATTTACGGTT	ATCGGTCAGC	TTTCCGCCCA	3450
ACATAAGGCG	ATCAACCTTT	CTCAGGGCGC	GCCCAACTTC	CCCTGTGACC	3500
CGCAGCTTAT	TGCCGGAGTC	ACCAGGGCAA	TGCAGGAGGG	GCATAACCCAG	3550
TATGCGTCCA	TGACCGGACT	TGCGTCGCTG	AAAAATCTTA	TTGCTGAAAA	3600
AGTCGCGGCG	CTTTACGGCT	CAACCTACGA	TCCGGCGGAT	GAAGTGCTGG	3650
TTACCGCCAG	CGCCAGCGAA	GGGCTGTATT	CCGCTATCGG	CGGACTGGTA	3700
CACCCCGGCG	ACGAAGTTAT	CTATTTTCGAA	CCCTCTTTTG	ACAGCTACGC	3750
GCCGATTGTT	CGGCTCCAGG	GCGCAACGCC	GGTTGCCCTT	AAGCTCAGCC	3800
TGCCTGACTT	CACCATTAAC	TGGGATGAAG	TGCGCGCTGC	CATAACGCCG	3850
CGTACCCGCA	TGATTATTGT	CAACACGCCG	CATAACCCAA	GCGGGCAGGT	3900
GTTCAGCGCT	CATGATCTCG	AAATGCTGGC	GGCGCTTACC	CGTAATACGG	3950
ATATCGTTGT	CCTGTCTGAC	GAAGTGACG	AGCACATCGT	GTTTGACGGA	4000
CAAAAGCATC	ACGGCATGGC	CACGCACCCG	CAGCTTGCCG	AGCGTAGCGT	4050
TATCGTTTTCA	TCGTTTGGCA	AAACCTTCCA	TGTTACCGGC	TGGCGCGTGG	4100
GGTACTGCCT	TGCGCCCGCC	GCGTTGATGG	ATGAGATTG	CAAGGTGCAT	4150
CAGTTCCTGA	TGTTTTTCAGC	CGATACGCCA	ATGCAGCACG	CTTTTGCTGA	4200
TTACATGAGC	GATCCGCAAA	CTTATCTCTC	GCTGGCGAGC	CTTTACCAGC	4250
GCAAGCGTGA	TTTAATGCAG	TCTCTGCTGG	CGGAGTCGCC	ATTGAGCTG	4300
CTGCCGAGCG	CCG				4313

Figure 2**Nucleotide sequence of ORF for esterase/lipase in ELIP clone
(SEQ ID NO:2)**

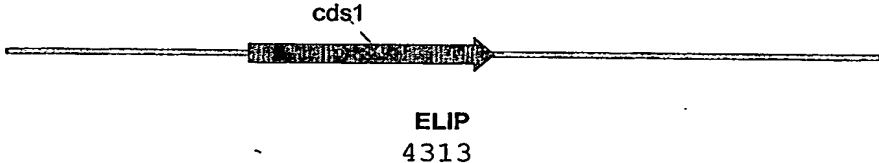
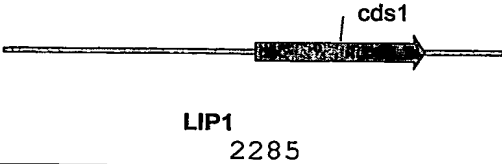
ATGGTCTGGC	TGCACGGTGG	GGGCTACACT	ATCGGCGCAG	GCTCGCTGCC	50
GCCCTACGAT	GGAGCAGCCT	TCGCCTCGCG	GGATGTAGTC	CTGGTGACGG	100
TGAATTACCG	TCTTGGCCAT	CTCGGCTTTT	TCGCCCATCC	GGCGCTGGAT	150
GAAGAAAATC	CAGACGGCCC	GGTTCATAAT	TTCGCGCTTT	TAGACCAAAT	200
TGCTGCCCTG	AAATGGGTGC	AGGAAAATAT	CGCTGCTTTC	GGCGGCGACG	250
CGGGGAATGT	CACGCTGTTC	GGCGAGTCTG	CCGGGGCGCG	TAGCGTGCTT	300
TCGCTGCTGG	CGTCGCCGCT	GGCGAAAAAC	CTTTTCCACA	AAGGTATTAT	350
ACAAAGCGCC	TACACGTTGC	CGGATGTCGA	CAGGAAGAAA	GCCCTGAAAC	400
GTGGCGTAGC	GCTGGCCGGT	CATTACGGGC	TGCAAAATGC	CACAGCGGAT	450
GAACTCCGCG	CTCTGCCTGC	GGATGGGCTG	TGGGCGCTTG	AAGGGCCGCT	500
TAACATTGGT	CCAACGCCAA	TCTCCGGCGA	CGTCGTGCTG	CCTGAGCCGA	550
TGCTGGATAT	ATTCTTCGCC	GGGCGTCAGC	ACCGCATGCC	CTTGATGGTC	600
GGGAGCAACA	GCGACGAGGC	AAGCGTGCTG	AGCTACTTCG	GCATCGATCC	650
TGCCGGGCAG	GTCGAACTGC	TGCGCCGGGG	AGCGGCGTTT	CCGGACTGGG	700
GGCTTATCAA	ACTGCTGTAT	TCCC GGAGTG	AAANGGGGAT	GCCCGAACTC	750
GGGCGACAGG	TGTGCCGCGA	TATGGCTTTT	NCCNCGCTGG	GTTTTGTTGT	800
GATGCAGGCC	CAGCAGCGGG	TCAATCAGCC	CTGCTGGCGC	TACTATTTTG	850
ATTATGTGGG	GGAGGCGGAA	CGTAAAATCT	ATGCCAACGG	CACCTGGCAC	900
GGCAACGAAG	TGCCGTATGT	TTTTGACACG	TTAAGTCTGA	CGCCACCCGC	950
AAGTGAATAC	GTCAACCAAA	ACGATCTCAC	GTTTGCCGGG	CAAATTTGTG	1000
ACTACTGGAC	CCGTTTTGCC	CGCAGCGCCG	GTCCCCACAG	TAAAGCGATA	1050
CCGGGCCCCG	TAAGCTGGCC	TGCCTGCGTT	CGCGGCAAGG	ACCGAACGAT	1100
GCGGTTAGGC	GTTCACTCGC	GGGCGCGGTT	CAAAGTGGA	AACCGCTTTA	1150
TGCGCATGAG	AATGCAGCTG	TTTAAGCGGG	TCATGAAGCA	TCACGTCAGC	1200
CTTGACTGA					1209

Figure 3

Translated amino acid sequence of the putative esterase/lipase from the ELIP clone (SEQ ID NO:3)

MVWLHGGGYT	IGAGSLPPYD	GAAFASRDVV	LVTVNYRLGH	LGFFAHPALD	50
EENPDGPVHN	FALLDQIAAL	KWVQENIAAF	GGDAGNVTLF	GESAGARSVL	100
SLLASPLAKN	LFHKGIIQSA	YTLPDVDRKK	ALKRGVALAG	HYGLQNATAD	150
ELRALPADGL	WALEGPLNIG	PTPISGDVVL	PEPMLDIFFA	GRQHRMPLMV	200
GSNSDEASVL	SYFGIDPAGQ	VELLRGAAAF	PDWGLIKLLY	SRSEXGMPEL	250
GRQVCRDMAF	XX LG FVVMQA	QQRVNQPCWR	YYFDYVGEAE	RKIYANGTWH	300
GNEVPYVFDT	LSLTPPASEY	VNQNDLTFAG	QICDYWTRFA	RSAGPHSKAI	350
PGPLSWPACV	RGKDRTMRLG	VHSRARFKVE	NRFMRMRMQL	FKRVMKHHVS	400
LD*					402

Figure 4**Details of the putative ORF's encoding esterase/lipase activity**

Clone	ORF		Length	Translated protein
	Start position	End position		
ELIP	1193	2401	1209 bp	402 amino acids
				
LIP1	1143	1934	792 bp	263 amino acids
				
LIP2	2675	2031	645 bp	214 amino acids
